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AUTHOR Somwaru, Jwalla P.
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ABSTRACT

The paper discusses a new battery of tests, the Assessment of Basic Competencies, designed for fair assessment of the latent abilities of minority group children. It is explained that the tests provide diagnostic assessment in several domains of competence that are considered important for school learning. The three domains, information processing, language, and mathematics, are said to be covered by 11 tests which measure specific enabling skills, weaknesses and strengths are identified, suggestions are made for educational intervention, and lists of selected instructional resources are presented with annotations. The author asserts that low test performance does not reflect bias; it reflects greater educational need in domains significant for acquiring school learning. (Author/CL)

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CRITERION-REFERENCED ASSESSMENT OF BASIC COMPETENCIES

Name of Author: Jwalla P. Somwaru, Ed.D.

Title: Assessment Specialist, Division of Special Services

Institution: Minnesota Department of Education

Address: 550 Cedar St., St. Paul, MN 55101

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ABSTRACT

Intelligence tests often are considered biased because it is believed that they do not fairly assess the latent abilities of children from minority groups. A new battery of tests, the Assessment of Basic Competencies, has been designed to obviate this problem by providing diagnostic assessment in several domains of competence that are considered important for school learning. The three domains, Information Processing, Language, and Mathematics, are covered by 11 tests which assess specific enabling skills. Weaknesses and strengths are identified, suggestions are made for educational intervention, and lists of selected instructional resources are presented with annotation. Low test performance does not reflect bias; it reflects greater educational need in domains that are significant for acquiring school learning, the implication being that assessment should be followed by appropriate instruction.

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CRITERION-REFERENCED ASSESSMENT OF BASIC COMPETENCIES

(An Alternative to Potentially Biased Intelligence Testing)

The issue of discriminatory testing grew out of a recognition that intelligence tests - both group and individual - favor white middle-class children, and by the same logic, discriminate against children from minority groups. In this school of thought, it is believed that there is an ideal quality, called intelligence, which is independent of culture, and that tests produce measures of this quality with varying degrees of accuracy, depending on factors such as item bias, reliability, etc. Contemporary cognitive theory, and new educational needs, however, make the construct of intelligence unnecessary, and the concept of bias of less importance. Gagne's cumulative learning model (1968) posits that simple associative learnings lead to the formation of concepts and generalizations in the form of principles, theories, or strategies. Hunt (1961) makes a strong case for a re-interpretation of the concept of intelligence as consisting of generalized learnings. Therefore, if one is concerned with school learning situations designed to provide "appropriate education for all handicapped children," the important issues then become the identification of prior learnings and the elements of the tasks to be learned, rather than the measurement of potential ability for acquiring learning.

Assessment in this new context should have three desirable properties:

(a) It should be based on objective criteria that are clearly defined.

(b) It should be descriptive of the current status of the learner, and not predictive of potential performance.

(c) It should scale performance along growth curves on an equal interval scale so that the learner's developmental status could be determined from time to time on the same continuum.

The Assessment of Basic Competencies (Somwaru, 1979) is a new test battery which has these properties; it was developed to provide diagnostic assessment in the areas of information processing, language, and mathematics. Given societal expectations for the outcomes of schooling, and recognition of the skills needed by youngsters in school and after school, there is likely to be little disagreement about the importance of the three areas of competencies that are assessed by the new test battery. Children must have competency in these areas in order to acquire school learning and to function in society outside of school.

While the purpose of the battery is diagnostic assessment, so that appropriate education can be implemented, it is expected that performance on the battery will also describe developmental status and reveal differences that exist among individuals and groups. It is expected that minority groups will perform poorly on some items, or on some tests as a whole. This kind of differential information is needed for intervention. Differential performance reflects cultural inequality and differential educational needs, not test bias. This is the rationale of the Assessment of Basic Competencies, hereafter referred to as the ABC.

Definition of Constructs and Content

When Binet designed his intelligence test he used a wide variety of cognitive tasks in the hope that together they would represent a fair sampling of a person's mental ability. No attempt was made then,

nor in later revisions of his test, to define the cognitive domain being assessed, or to organize its contents into meaningful dimensions. It was believed to be sufficient for the test to give a global measure of mental ability in terms of the behavior of norm groups. This tradition has been followed in several widely used group tests of intelligence. In the Wechsler Intelligence Scale for Children (WISC), the general ability which is supposed to underlie the test is considered as being more important than those abilities measured by the separate subtests. In most tests of intelligence or aptitude, items are selected if they, in combination, discriminate well among the examinees. These tests generally are considered valid by virtue of their ability to predict school achievement. Construct validity usually is not addressed.

If the structure and content of an aspect of ability are defined, then it is possible to assess the validity of an instrument against the substance of what has been defined, or against other measures of the defined trait or ability. In the development of the ABC construct definition was carried out at three levels. The levels are as follows:

Level 1: Content Domains (see Figure 1):

INFORMATION PROCESSING

Tests:
- Relating (Relational)
- Organizing (Conceptual)
- Observing (Perceptual)

LANGUAGE

Tests:
- Reading for meaning
- Decoding
- Comprehending expressions
- Producing expressions
- Understanding words

MATHEMATICS

Tests: Solving problems
Understanding concepts
Knowing number and operations

Level 2: Instructional Clusters:

Each subtest consists of groupings of skills called instructional clusters. These have a degree of generality that is above the specific skills tested by items.

Level 3: Skills:

Each instructional cluster consists of several related skills that are specifically tested by one or more items.

If the competencies defined as the domain of the ABC battery of tests match the competencies considered important for facilitating learning in school situations, then the battery would be valid for assessing functional competence, and both quantitative and qualitative assessment could be usefully carried out with a view to instructional intervention. In other words, if the test identifies the absence of certain skills or competencies in a child, or a lag in their development, the child's educational needs would have been identified.

Scaling of Performance

In the literature and discourse on criterion-referenced tests, two frames of reference are used. One aims at collecting an inventory, while the other focuses on measuring within a domain. In the former context, one specifies a list of criterion behaviors that must each be satisfied, or that must be satisfied as a group at a specified level, say, for example, at the 90% level. The process of collecting an inventory is complete when one identifies the specific objectives that

are to be satisfied, and indicates which ones are satisfied. The second frame of reference is consistent with the definition of "criterion-referenced test" given by Glaser and Nitko (1971). They state that after a domain has been defined, "measurements are taken on representative samples of tasks drawn from this domain" (p. 653). In this context, a latent trait (Hambleton & Cook, 1977) is presumed to underlie the domain, and measurement is the process of locating a person on the latent trait continuum represented by the selected items. In order to make such measurement possible, the selected items have to be scaled, and a method of scoring devised that will allow the translation of observed behaviors into points on the scale, and the interpretation of these with reference to the domain. Possibly (but not necessarily), performance could be interpreted further with the aid of external referents (Sympson, 1979).

The ABC was conceived and designed as a criterion-referenced test within the second frame of reference. The broad domains were defined, and items were developed to assess a representative selection of skills. These items were calibrated and put into equal-interval scales that approximate the growth curves of each of the domains. It will thus be possible to obtain measurements of ability along these scales within defined domains of cognitive behavior. A useful feature of these measurement scales is that the same metric is used for scaling performance in all subtests across all ages, with points anchored at the means for Kindergarten and Grade 8. Figure 2 illustrates this system of scaling.

Components of the Test Battery

The test battery includes the following components:

(a) The Assessment of Basic Competencies

This is the main diagnostic battery consisting of the 11 tests described earlier. The content of these tests and their relationships with each other are represented in Figures 1 and 2. Seven of the tests contain 100 items each, covering the range Age 3+ years to Age 15 (or Grade 9); the other four tests contain 85 items each, ranging from Kindergarten to Grade 9. This diagnostic battery may be given to children who manifest a wide range of learning problems. Each test is adaptive in design, and basal and ceiling rules are used to economize on time. It is suggested that prior information on pupil performance, such as existing test data, teacher knowledge, or performance on the Survey test described below, be used in order to determine which parts of the battery should be given, and what starting points should be used for each test.

(b) The Survey of Basic Competencies

This survey has been designed as a brief test that can be used to identify potential areas of disability among students. It can be used by the teacher, teacher-aid, resource teacher, or diagnostician for rapid screening or assessment, or for determining points of entry into the full diagnostic battery. The test consists of four subtests:

Information Processing	(36 items)
Language	(36 items)
Reading	(30 items)
Math Reasoning	(36 items)

(c) Test of Early Learning Skills

This test, consisting of 54 items grouped into three short tests, has been designed to provide a descriptive assessment of pupils' cognitive levels of functioning in preschool and kindergarten. This test was not designed to be a screening device, but rather, a teaching tool to be used by teachers or teacher aids. The subtests in this test are:

Thinking Skills	(18 items)
Language Skills	(18 items)
Mathematics Skills	(18 items)

The items for the diagnostic battery ABC, the Survey, and the Test of Early Learning Skills were drawn from the same pool of calibrated items, and have the same characteristics and purpose.

Potential Applications

The tests may be used effectively for several purposes. Among these purposes are:

(a) Diagnostic Assessment of Learning Disabilities

If individual needs are to be met, systematic diagnosis needs to be carried out prior to program prescription. The test battery provides for qualitative assessment within each test area. For each item in the test, there is a specific statement of the skill that is being assessed. Items measuring the same skill are grouped into clusters. The listing of all items and skills on the response form makes qualitative assessment convenient and easy. The examiner or teacher can observe the pattern of correct and incorrect responses in

regard to the content of the items attempted. While the responses to particular items would no doubt be of interest to teachers, it is suggested that diagnosis for the purpose of instructional intervention be carried out at the level of clusters, since these represent more generalized learnings. This kind of diagnostic information, used in conjunction with the instructional resources listed in the test manual, could greatly facilitate the construction of an Individualized Educational Program (IEP).

(b) Assessment of Mental Retardation

If retardation is defined as developmental lag, the ABC will provide an adequate basis for determining whether retardation exists in each or all of the test scales. In each of the scales, the child's performance is translated first into an ability estimate, and then into a developmental age. A developmental age represents a typical age for a particular level of performance; it is the mean age of all persons who are at a particular ability level. Developmental age is an essentially normative concept, as is the concept of retardation. If a 10-year-old's performance translates into a developmental age of 6 years, the lag is very obvious. The amount of deviation from the norm required for the lag to be significant has to be decided by professional judgment. Professional judgment can be facilitated by the confidence limits reported for each scale. A qualitative interpretation can be made by examining the content of the items which lie

between the actual level of performance and the normative expectation of the child's age peers.

(c) Assessment of Growth or Change in Learning Status

Although educational programs should be able to demonstrate that positive change has taken place, current methods of evaluation are very crude, and cannot assess growth. Each test of the ABC has been scaled on a continuum which approximates the growth curve in that particular domain. The scale ranges over 100 points, and is anchored at Kindergarten and Grade 8 for the purpose of giving it normative meaning. The 100 points are equal-unit intervals. This psychometric feature enables one to retest a child from time to time and to assess growth on the same scale. This approach is far superior to the current practice of using grade equivalents to determine growth or change.

Conclusion

The notion of "test bias" implies a difference between an ideal measure of ability and actual performance. The ABC does not attempt to measure any ideal quantity. In the process of diagnostic assessment for learning disabilities, one is trying to identify skills that are lacking; in the assessment of retardation, one is trying to locate a child on a developmental continuum; in the assessment of growth, one is trying to find out how much change has taken place. Given the goals of schooling defined by society, the skills assessed in the ABC test battery can be considered as "enabling" skills; descriptive assessment in clearly defined domains cannot, therefore, be biased if the purpose is to determine educational needs.

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DEFINITION OF BASIC COMPETENCIES

LANGUAGE SKILLS

READING:
- Literal and inferential comprehension-detail, main idea, sequence, cause-effect.

DECODING:
- Knowing letters and sounds, discriminating between sounds, pronouncing words.

COMPREHENDING and PRODUCING EXPRESSIONS:
- Using nouns, adjectives, adverbs, pronouns.
- Using verbs, auxiliary, modal, copula.
- Using function words – prepositions, determiners, conjunctions, qualifiers, etc.
- Understanding sentence structure.
- Transforming sentences.
- Knowing usage and idioms.

UNDERSTANDING WORDS:
- Words for objects, descriptions, actions, categories, and abstract ideas.

MATH. REASONING SKILLS

SOLVING PROBLEMS:
- Solving problems involving various applications in 1, 2, or 3 steps.

UNDERSTANDING CONCEPTS:
- Sets and relations.
- Number sentences and symbolic expressions.
- Units of measurement – English and metric.
- Units of money and combinations.
- Geometry and graphs.

KNOWING NUMBER AND OPERATIONS:
- Number and numeration.
- Order
- Four operations with whole numbers, common and decimal fractions.
- Conservation of number.

INFORMATION PROCESSING SKILLS

RELATING:
- Identifying incongruent relations, inferring rules, completing analogies, solving combinations, making transitive inference, solving problems.

ORGANIZING:
- Excluding from class, including in class, relating classes, ordering in sequence.

OBSERVING:
- Comparing for similarity or difference, seeing and remembering, completing patterns, visualizing figures after rotation, integrating eye-hand activity, finding figure in background, conserving mass, length, weight, volume.

Figure 1

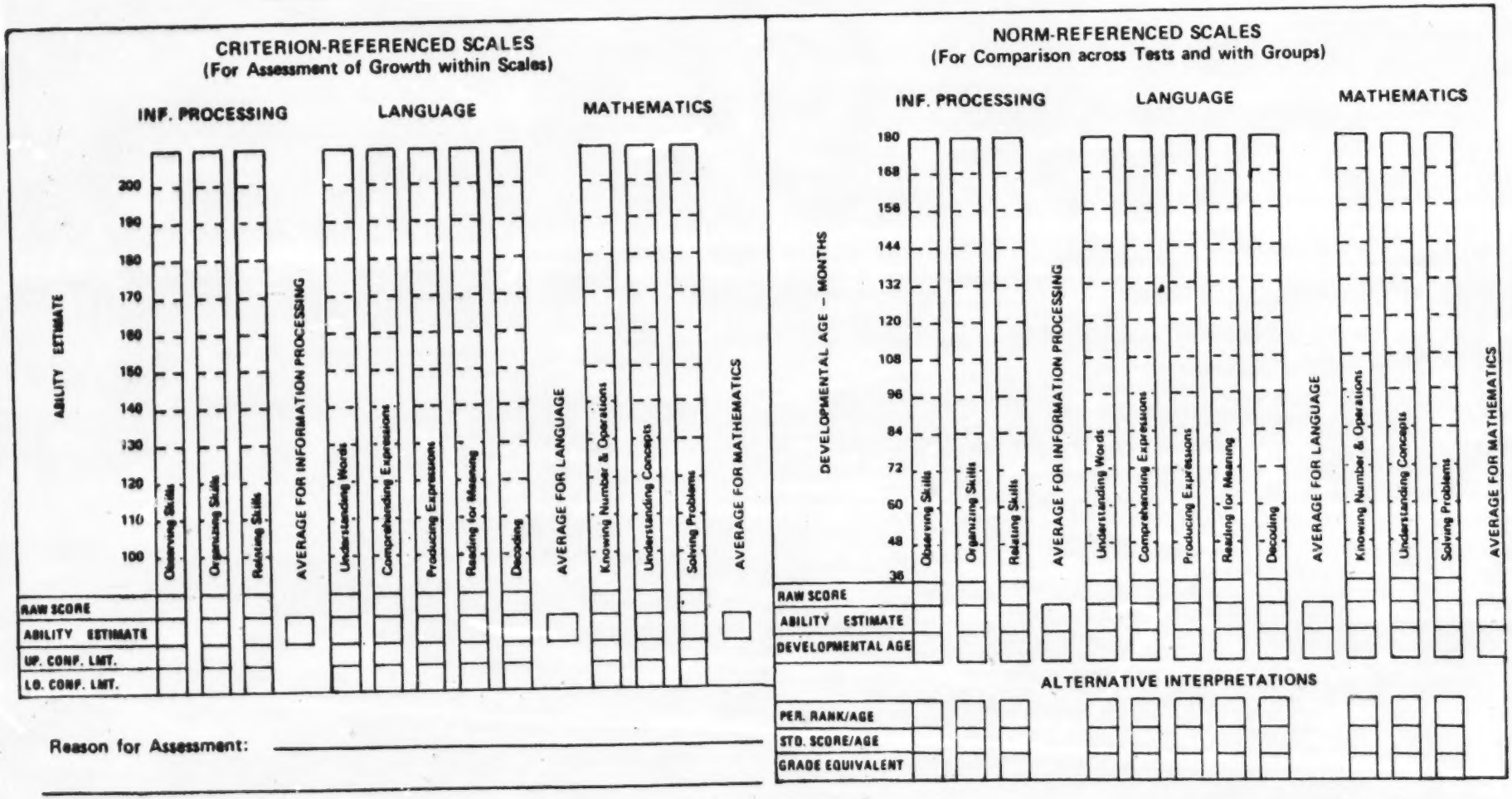
(Abstracted from User's Manual, Assessment of Basic Competencies. Copyright reserved by author)

ASSESSMENT OF BASIC COMPETENCIES — RESPONSE FORM

Name: _____ Date of Testing: Yr. _____ Mth. _____ Day _____

School: _____ Date of Birth: Yr. _____ Mth. _____ Day _____

Teacher: _____ Grade: _____ Age (Nearest Mth.) _____ Sex: _____



Reason for Assessment: _____

Referred by: _____ Assessed by: _____

Figure 2

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